NSAnimatablePropertyContainer Protocol Reference

Graphics & Animation: Animation

2009-05-06

Apple Inc.
1 Infinite Loop
Cupertino, CA 95014
408-996-1010

Simultaneously published in the United States and Canada.

Contents

NSAnimatablePropertyContainer Protocol Reference

Adopted by	NSWindow NSView
Framework	/System/Library/Frameworks/AppKit.framework
Availability	Available in Mac OS X v10.5 and later.
Declared in	NSAnimation.h

Overview

The NSAnimatablePropertyContainer protocol defines a way to add animation to an existing class with a minimum of API impact. It returns a proxy object for the receiver that can be used to initiate implied animation of property changes. An object's animator proxy should be treated as if it was the object itself, and may be passed to any code that accepts the object as a parameter. Sending of key-value-coding compliant "set" messages to the proxy will trigger animation for automatically animated properties of its target object.

An object's automatically animated properties are those for which `NSAnimatablePropertyContainer` (page 5) finds and returns an CAAnimation instead of nil, often because `animator` (page 8) specifies a default animation for the key.

It's perfectly valid to set a new value for a property for which an animation that is currently in progress; this simply sets a new target value for that property, with animation to the new target proceeding from whatever current value the property has reached. An in-flight property animation can be stopped by setting a new value for the property bracketed by an `NSAnimationContext` with 0.0 as the duration.

Tasks

Getting the Animator Proxy

- `animator` (page 8) *required method*

  Returns a proxy object for the receiver that can be used to initiate implied animation for property changes. (required)

Managing Animations for Properties

- `animations` (page 7) *required method*
  Returns the optional dictionary that maps event trigger keys to animation objects. (required)
- `setAnimations:` (page 9) *required method*
  Sets the option dictionary that maps event trigger keys to animation objects. (required)
- `animationForKey:` (page 7) *required method*
  Returns the animation that should be performed for the specified key. (required)
+ `defaultAnimationForKey:` (page 6) *required method*
  Returns the default animation that should be performed for the specified key. (required)

Class Methods

defaultAnimationForKey:

Returns the default animation that should be performed for the specified key. (required)

```
+ (id)defaultAnimationForKey:(NSString *)key
```

Parameters

key

The action name or property specified as a string.

Return Value

The animation to perform. A subclass of `CAAnimation`.

Discussion

The `NSAnimatablePropertyContainer` (page 5) method consults this class method when its search of the receivers `"Getting the Animator Proxy"` (page 5) dictionary fails to return an animation for *key*.

An animatable property container should implement this method to return a default animation to be performed for each key that it wants to make auto-animatable, where *key* usually references a property of the receiver, but can also specify a special animation trigger (`NSAnimationTriggerOrderIn` (page 9) or `NSAnimationTriggerOrderOut` (page 9)).

A developer implementing a custom view subclass, can enable automatic animation for properties by overriding this method, and having it return the desired default `CAAnimation` subclass to use for each of the property keys of interest. The override should defer to super for any keys it doesn't specifically handle, facilitating inheritance of default animation specifications. The following is an example of such an implementation.

```
@implementation MyView
+ (id)defaultAnimationForKey:(NSString *)key {
    if ([key isEqualToString:@"borderColor"]) {
        // By default, animate border color changes with simple linear
interpolation to the new color value.
        return [CABasicAnimation animation];
    } else {
        // Defer to super's implementation for any keys we don't specifically
handle.
```

```
        return [super defaultAnimationForKey:key];
    }
}
@end
```

Availability
Available in Mac OS X v10.5 and later.

Declared In
`NSAnimation.h`

Instance Methods

animationForKey:

Returns the animation that should be performed for the specified key. (required)

```
- (id)animationForKey:(NSString *)key
```

Parameters

key
The action name or property specified as a string.

Return Value
The animation to perform. A subclass of `CAAnimation`.

Discussion
When the action specified by *key* is triggered for an object, this method is consulted to find the animation, if any, that should be performed in response.

Like its Core Animation `CALayer` counterpart, `actionForKey:`, this method is a funnel point that defines the order in which the search for an animation proceeds.It first checks the receiver's "Getting the Animator Proxy" (page 5) dictionary for a value matching *key*, then falls back to `animator` (page 8) for the receiver's class.

Subclasses should not typically need to override this method.

Availability
Available in Mac OS X v10.5 and later.

See Also
`- animator` (page 8)
"Managing Animations for Properties" (page 6)
"Getting the Animator Proxy" (page 5)

Declared In
`NSAnimation.h`

animations

Returns the optional dictionary that maps event trigger keys to animation objects. (required)

```
- (NSDictionary *)animations
```

Return Value
The animations as a dictionary.

Discussion
When an action occurs that may trigger an animation the `NSAnimatablePropertyContainer` (page 5) method first looks in this dictionary for an animation that matches the key. Typically, the key will name a property of the object whose value has just changed, but it may specify a special event trigger (`NSAnimationTriggerOrderIn` (page 9) or `NSAnimationTriggerOrderOut` (page 9)).

Availability
Available in Mac OS X v10.5 and later.

See Also
`- animator` (page 8)
`"Managing Animations for Properties"` (page 6)

Declared In
`NSAnimation.h`

animator

Returns a proxy object for the receiver that can be used to initiate implied animation for property changes. (required)

```
- (id)animator
```

Return Value
Returns a proxy object for the receiver that can initiate implied animations in response to property changes.

Discussion
The animator proxy object should be treated as if it was the receiver itself, and may be passed to any code that accepts the receiver as a parameter.

Sending key-value coding compliant "set" messages to the proxy will trigger animation for automatically animated properties of its target object, if the active `NSAnimationContext` in the current thread has a duration value greater than zero, and an animation for the property key is found by the `NSAnimatablePropertyContainer` (page 5) search mechanism.

Availability
Available in Mac OS X v10.5 and later.

Related Sample Code
BasicCocoaAnimations
CocoaSlides
LayerBackedOpenGLView
UIElementInspector

Declared In
`NSAnimation.h`

setAnimations:

Sets the option dictionary that maps event trigger keys to animation objects. (required)

```
- (void)setAnimations:(NSDictionary *)dict
```

Parameters

dict

A dictionary containing the event trigger keys and associated animation objects.

Availability

Available in Mac OS X v10.5 and later.

See Also

`NSAnimatablePropertyContainer` (page 5)

`- animator` (page 8)

`"Getting the Animator Proxy"` (page 5)

Declared In

`NSAnimation.h`

Constants

Transition Animation Keys

The following constants define the keys that reference the transitions used as views are made visible and hidden.

```
NSString *NSAnimationTriggerOrderIn;
NSString *NSAnimationTriggerOrderOut;
```

Constants

`NSAnimationTriggerOrderIn`

The key that references the transition animation used when a view becomes visible, either as a result of being inserted into the visible view hierarchy or as a result of the view no longer being set as hidden .

Available in Mac OS X v10.5 and later.

Declared in `NSAnimation.h`.

`NSAnimationTriggerOrderOut`

The key that references the transition animation used when a view is no longer visible, either as a result of being removed from the visible view hierarchy or as a result of the view set as hidden.

Available in Mac OS X v10.5 and later.

Declared in `NSAnimation.h`.

Document Revision History

This table describes the changes to *NSAnimatablePropertyContainer Protocol Reference*.

Date	Notes
2009-05-06	Corrected typos.
2007-10-31	Corrected minor typos.
2007-07-24	New document that describes the protocol used to provide an animatable proxy object for views and windows.

Document Revision History